Clean Air Act 112(r) INSPECTION REPORT

Name: Big Ox Energy- Siouxland, LLC	
Address: 1616 D Ave. Dakota City, NE 68731	Date of Inspection: 2/13 - 15/2017
County: Dakota	Case No: 17NE0213
Phone: 844-491-1953	RMP No: N/A
High Risk: No	FRS No: 110064587656
Title V: No (NDEQ CP15-008)	Program Level: General Duty Clause
Mailing Address: 6601 County Road R, Denmark, WI 54208	
Process: Biogas production from anaerobic digestion of waste water from multiple sources. NAICS: 325199 - All other basic organic chemical manufacturing	

Summary of Observations

1. **Big Ox Energy- Siouxland, LLC failed to identify hazards which may result from extremely hazardous substances releases using appropriate hazard assessment techniques CAA 112(r)(1).**

2. **Big Ox Energy- Siouxland, LLC failed to design and maintain a safe facility taking such steps as are necessary to prevent releases CAA 112(r)(1).**

Introduction

Laura Brewer and I (Dave Hensley) with the U.S. Environmental Protection Agency, Region VII, (EPA) inspected Big Ox Energy- Siouxland, LLC (Big Ox) located in Dakota City, NE on February 13 and 15, 2017. We were accompanied by Sean Bergin of EPA. Sean Bergin conducted a forward looking infrared (FLIR) camera survey of the facility to identify any ongoing methane releases. We were also accompanied by two Nebraska Department of Environmental Quality (NDEQ) inspectors, Nathan Kush and Kyle Morton, who were interested in FLIR camera inspection techniques Sean could share.

Big Ox was selected for inspection based on a series of incidents, complaints, and potential evidence of releases. The inspection was conducted to determine if the facility complies with Section 112(r) of the Clean Air Act (CAA), as amended in 1990. The inspection also included reporting provisions of the Emergency Planning and Community Right to Know Act (EPCRA) and the release reporting provisions of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

EPA has published a document, EPA 550-B00-002, dated May 2000, titled "Guidance for Implementation of General Duty Clause Clean Air Act Section 112(r)(1)". This publication is intended solely for the guidance of government personnel but is available to the public at the EPA's website.

Section 112(r)(1) of the CAA requires that owners and operators of stationary sources identify hazards which may result from accidental releases using appropriate hazard assessment

techniques, design and maintain a safe facility taking such steps as necessary to prevent releases, and minimize the effects of accidental releases which do occur whenever extremely hazardous substances are present at their facility. The general duty clause of Section 112(r)(1) and its implementation promotes safe operating practices and prevent chemical accidents.

History of Business

Big Ox is a new biologically-based natural gas production facility located in Dakota City, Nebraska. The State of Nebraska air quality construction permit CP15-008 was issued on April 15, 2016. Big Ox biogas facility is capable of producing up to 1,314 million standard cubic feet of biogas per year from an anaerobic digestion process. At the time of this inspection, Big Ox had not put any natural gas into the pipe line. All the natural gas produced had been flared. Big Ox will process wastewater and organic wastes from the surrounding industries. Big Ox Energy LLC appears to be the parent company or owner to Big Ox Energy- Siouxland, LLC.

Applicability

Big Ox appears not to be subject to CAPP, and not required to submit a risk management plan (RMP). The substances present below listed thresholds at 40 C.F.R. Part 68.130 of the Chemical Accident Prevention Provisions (CAPP) are hydrogen sulfide, CAS No. 7783–06–4, and methane, CAS No. 74–82–8. EPA sent a CAA information request to Big Ox on December 22, 2016, in which EPA asked if methane, CAS no. 74-82-8 and hydrogen sulfide, CAS no. 7783-06-4 are stored onsite, and if so, what is the maximum intended inventory. On January 27, 2017, Big Ox provide estimated quantities of biogas, methane, and hydrogen sulfide in a letter, from Haley & Aldrich, Inc. dated January 25, 2017. It was noted that the calculations in this letter did not take into account the length of biogas piping. This was communicated to Big Ox on February 1, 2107. A corrected letter from Haley & Aldrich, Inc. dated February 2, 2017, was provided by Big Ox on February 8, 2017. The maximum intended inventory was calculated by Big Ox's contractors, by Laura, and by myself with reasonable agreement to be under the 40 C.F.R. Part 68.130 thresholds for methane and hydrogen sulfide.

Biogas is a flammable mixture containing more than one percent methane, a listed flammable substance. Based upon information contained in the Safety Data Sheet reviewed during the inspection, it appears the entire biogas mixture meets the National Fire Protection Association (NFPA) class 4 flammable rating. Thus, the entire quantity of biogas must be considered when determining if a threshold quantity of methane is present, per 40 C.F.R. Part 68.115(b)(2).

During this inspection, it was determined that the anaerobic digesters are rectangle and not round as indicated on the maximum inventory calculation sheet provided in the Section 114 request response. Rob described the digesters as equally designed with a 39 feet 6 inch inside length by 373 inch inside width. The total height is 20 to 21 feet however; the height is sloped. Maximum liquid height is 19.3 feet. The plant capacity is 3 million gallons per day and is currently operating at 1.6 million gallons per day. During this inspection, it was also determined that when the facility is fully functioning there will be some quantity of biogas, methane, and hydrogen sulfide in a biogas clean up skid that was not accounted for thus far in the maximum inventory calculation. This additional biogas quantity will not likely cause Big Ox to exceed the 10,000-pound threshold, of 40 C.F.R. 68.130.

Facility Description

The following facility description is from Big Ox's NDEQ Air Quality Construction Permit Number CP15-008, and discussions during this inspection.

Big Ox receives liquid wastewater into the facility that is collected in the dissolved air flotation (DAF) feed tank. The DAF feed tank contents are transferred to undergo treatment in a DAF process unit; the resulting solids from the DAF is sent to the equalization/mixing tank while the effluent wastewater is sent to the sanitary sewer.

Big Ox receives high strength wastes and packaged/canned food wastes by truck. The high strength wastes are unloaded into two receiving pits which flow to the receiving tank, while the packaged/canned food wastes are unloaded into a separator. The separator separates the organic waste from the packaging material and the organic waste is sent to the receiving tank while the packaging waste is hauled out by truck. The receiving tank contents are pumped to the equalization/mixing tank. From the equalization/mixing tank, Big Ox transfers the contents through a heat exchanger to anaerobic digester #1 and then to anaerobic digester #2. The contents from anaerobic digester #2 are dewatered using two centrifuges; the concentrate from the centrifuges is sent to the DAF Feed Tank while the dewatered cake will be hauled out by truck. Big Ox will send the untreated biogas from the Anaerobic Digesters #1 and #2 to the biogas cleanup skid system. The piping caring the biogas from the digesters to the flare and the biogas clean up skid runs along the roof of the digester building and on into the field that served as the site of the biogas clean up skid. This system will scrub, compress, and directly inject the treated biogas into the adjacent natural gas transmission line.

Inspector Note: The original permit application indicated a scrubbing process to remove sulfur – "*The scrubbing process will result in crystalline sulfur solids that will be washed and sold as a sulfur by-product*." The inspection showed this is not installed. Big Ox appears to believes that the waste streams received are low sulfur, thus this is not required.

If the biogas clean-up skid system is unavailable or treated biogas cannot be injected into the natural gas transmission line, Big Ox will send the biogas from the anaerobic digesters #1 and #2 to an industrial flare rated at 102.0 million British thermal units per hour (MMBtu/hr.). Big Ox has requested an operational limitation of 500 annual operating hours for flaring to limit emissions from the combustion of untreated biogas.

Persons Interviewed and Individual Responsibilities

Perry Winkler ……... Plant Manager
Mike Nelson …… Maintenance Manager
Jason Oswald ……...…… Big Ox Engineer
Kevin Bradley ……..... Director of Business and Economic Development
Robert Ernest ……... Operations Manager
Bill Guerry ……... Kelley Drye & Warren LLP Attorney
Jose Argueta ……... Plant Employee
Justin Peterson …….……. B&W MEGTEC
Tim Golden …….……. B&W MEGTEC

Opening Conference

On February 13, 2017, at 2:05 PM, we made an unannounced inspection entry at Big Ox's facility at 1616 D Ave. Dakota City, Nebraska. We signed in at the main gate guard building, and were asked to review and sign the safety protocols for the facility. These protocols only contained safety protocols so we reviewed and signed. Laura and I met with Perry Winkler, Plant Manager, in the break room.

Sean went with Mr. Argueta and the NDEQ inspectors to the control room and got a few answers to some basic questions: There are pressure monitors on the digesters, the pressure was 2.3 at the time of the inspection. The pressure in the duct work from the digesters to the flare is 9 inches of water. The pressure only goes up in the anaerobic digesters when the flare goes out, and that hasn't happened for about a month. It used to happen often, according to Mr. Argueta. At this point Sean, Mr. Argueta, and the NDEQ inspectors decided to go on the roof to FLIR the pressure relief valves (PRVs) and ducting. Mike Nelson met up with the team and asked them to stop the inspection and come with him to the conference room in the guard shack.

While Sean and the NDEQ inspectors began preparations for the FLIR survey with other Big Ox personnel, I presented my credentials and provided Mr. Winkler a Clean Air Act Section 112(r)(1), General Duty Clause fact sheet and a list of documents to be reviewed (Attachment 1). I presented a notice of inspection form and this was signed by myself and Perry Winkler (Attachment 2). I asked Mr. Winkler if he had participated in the CAA Section 114 information request response, and he stated that he had not. As I was explaining the purpose of the inspection and laying out an inspection plan with Mr. Winkler, he received calls, and expressed the desire to put the inspection on hold for a moment while Big Ox had a discussion. Sean and the NDEQ inspectors were retrieved from their preparations. We were all escorted to a conference room in the guard building by Mike Nelson.

In about ten minutes, Mr. Winkler came into the conference room and utilized a cell phone to call into a conference call with Jason Oswald, Big Ox Engineer; Kevin Bradley, Director of Business and Economic Development; Rob Ernest, Operations Manager; Bill Guerry, Attorney; and an un-named woman. Big Ox expressed concerns that the appropriate people were not on site for the inspection, that there were safety issues with training to have personnel on the roof, that the right people to provide safety training were not available, and that paperwork to be signed needed review. I explained the purpose for this inspection and the reason for Big Ox being targeted for the inspection. I explained the CAA section 114 authority to conduct inspections. I requested contact information from counsel, and was provided Bill Guerry's, of Kelley Drye & Warren LLP, contact information. I provided my name, email, and office phone number (Dave Hensley, hensley.dave@epa.gov, and 913-551-7768). We ended the call with a request from Big Ox to have a call with our EPA attorneys.

> CAA Section 114 (a) (1) and (2) states; *"(1) the Administrator may require any person who owns or operates any emission source, who manufactures emission control equipment or process equipment, who the Administrator believes may have information necessary for the purposes set forth in this subsection, or who is subject to any requirement of this Act (other than a manufacturer subject to the provisions of section*

206(c) or 208 with respect to a provision of title II) on a one-time, periodic or continuous basis to— (A) establish and maintain such records; (B) make such reports; (C) install, use, and maintain such monitoring equipment, and use such audit procedures, or methods; (D) sample such emissions (in accordance with such procedures or methods, at such locations, at such intervals, during such periods and in such manner as the Administrator shall prescribe); (E) keep records on control equipment parameters, production variables or other indirect data when direct monitoring of emissions is impractical; (F) submit compliance certifications in accordance with section 114(a)(3); and (G) provide such other information as the Administrator may reasonably require; and (2) the Administrator or his authorized representative, upon presentation of his credentials— (A) shall have a right of entry to, upon, or through any premises of such person or in which any records required to be maintained under paragraph (1) of this section are located, and (B) may at reasonable times have access to and copy any records, inspect any monitoring equipment and method required under paragraph (1), and sample any emissions which such person is required to sample under paragraph (1).”

After the call, I placed a call to EPA Region 7 Regional Counsel, to relay what had occurred and provide Big Ox’s attorney contact. During this call, I stepped out of the conference room to get better reception and reduce ambient noise. When I returned to the conference room, Big Ox personnel excused themselves while the attorneys spoke. Sean and the NDEQ inspectors left the facility to conduct what portions of the FLIR survey they could from public access near the facility. Laura and I remained in the conference room a few minutes. At approximately 4:20 PM, Laura and I went to the guard office and notified the guard that we would be leaving for the day, but planned on returning the following morning at 9:00 AM, and requested that he relay the message to Perry Winkler.

Upon reaching Highway 75 to the west of the facility, Laura and I noticed black smoke and flame coming from Big Ox’s flare. Recorded in Photographs 1 to 7 in Attachment 3, and presented below.

Photo 1: Smoke and Flame from Flare on February 13, 2017, from Highway 75 facing east, cropped and centered (Attachment 3)

Photo No. 4: Smoke and Flame from Flare on February 13, 2017, from railway access road, facing northwest, DSC01718 taken by Sean Bergin (Attachment 3)

Laura and I went to the area outside of the facility where Sean and NDEQ were taking FLIR observations and hydrogen sulfide readings. I observed that the black smoke and flame lasted over five minutes. After this, Laura and I left and checked into a hotel. Sean and NDEQ continued FLIR survey and hydrogen sulfide readings.

The NDEQ wrote up a memorandum detailing the February 13, 2017 site visit (https://ecmp.nebraska.gov/publicaccess/viewer.aspx?MyQueryID=180&OBKey%5F%5F115%5F1=&OBKey%5F%5F114%5F1=105921).

EPCRA Tier II and OSHA Documents

I reviewed the State of Nebraska Enterprise Content Management Portal, Occupational Safety and Health Administration's (OSHA) establishment inspection online database, and local news media. I identified some odor complaints and four incidents that appeared to have potential chemical releases. On October 19, 2016, a contract employee was hospitalized. On December 14, 2016, an employee injured due to a biogas release. On January 9, 2017, two employees were exposed to unidentified chemicals. On January 12, 2017, a lid blew off a tanker truck.

The presence of Extremely Hazardous Substances (EHSs) in quantities at or above the Threshold Planning Quantity (TPQ) requires certain emergency planning activities to be conducted. If a TPQ is equaled or exceeded, facilities with a listed EHS are subject to the reporting requirements of EPCRA section 311 (provide material safety data sheet or a list of covered chemicals to the SERC or TERC, LEPC, and local fire department) and section 312 (submit inventory form -Tier I or Tier II). The minimum threshold for section 311-312 reporting for EHS substances is 500 pounds or the TPQ, whichever is less. A EPCRA Tier II form is an inventory form that provide the following additional information for each hazardous chemical present at the facility: The chemical name or the common name of the chemical as provided on the material safety data sheet, an estimate (in ranges) of the maximum amount of the hazardous chemical present at the facility at any time during the preceding calendar year, an estimate (in ranges) of the average daily amount of the hazardous chemical present at the facility during the preceding calendar year, a brief description of the manner of storage of the hazardous chemical, the location at the

facility of the hazardous chemical, and an indication of whether the owner elects to withhold location information of a specific hazardous chemical from disclosure to the public under section 11044 of this title.

Big Ox has not submitted an EPCRA Tier II report. Big Ox is a new facility, their first EPCRA Tier II report would not be due until March 1, 2017. This report would cover the hazardous substances held onsite during 2016. The hazardous substances that we are aware of being present at Big Ox are biogas, methane, and hydrogen sulfide. The TPQ for hydrogen sulfide is 500 pounds. Methane and biogas do not have section 302 TPQs.

February 14, 2017

On February 14, 2017, at 8:30 AM Sean, Laura, and I had a conference call with EPA Region 7 Regional Counsel. We stood down while EPA Region 7 Regional Counsel and the Big Ox attorneys discussed access. Sean returned to publicly accessible areas near the facility to take more FLIR camera observations. While he was near the facility, he observed a similar flaring event as had occurred the previous day.

Photo No. 8: Smoke from Flare on February 13, 2017, facing north, DSCN0193, taken by Sean Bergin, Cropped (Attachment 3)

He informed Laura and I when he returned to the hotel. Laura and I remained in the hotel lobby working on other projects until lunch. I received a call from EPA Region 7 Regional Counsel, at 1:05 PM, as they were preparing for a call with Big Ox. We discussed what occurred on February 13, and what is required to do a CAA 112(r)(1) inspection. At 2:37 PM, I received another call from EPA Region 7 Regional Counsel letting me know that Big Ox agreed to allow entry the morning of February 15, 2017, but the Big Ox attorneys were verifying what time. They also indicated that Big Ox would be hesitant to provide any documentation during the inspection. I informed Laura. At 3:29 PM, EPA Region 7 Regional Counsel verified that the inspection was to resume at 9:00 AM on February 15, 2017.

Field Tour

On February 15, 2017, at 8:43 AM Laura and I arrived at Big Ox and signed in at the guard office. We met Kevin Bradley and Mike Nelson in the parking lot, and it was determined that high visibility vests are required. Laura had one, and I was provided one from the facility. At 9:00 AM, Sean and the NDEQ inspectors arrived. Kevin and I had a discussion about taking

photographs on site in which Kevin expressed concerns about confidential business information (CBI) being photographed. I told him I would let him know when I was taking a photograph and we can work around CBI items. Mike led us on a tour of the flare and biogas clean up skid areas of the facility. The flare is a John Zink ZTOF® type flare. The flare receives biogas when the pressure is above 9 inches of water column. A knockout drum is provided off the biogas line to remove any liquids before going to the pressure control valve. The flare is equipped with two automatic louvers for combustion air and two are set manually. The controls for the flare are local only. Mike and Perry tried to produce the run hour meter on the electronic control panel but were unable. They indicated there was a way to get data to a compact disc or electronic storage device but it required special software to read the data. I informed Kevin and took a photograph of the data plate on the west side of the flare, Photo No. 9, and an overview photograph, Photo No. 10, of the flare (Attachment 3).

Laura, Sean, and the NDEQ inspectors asked questions pertaining to the flaring events from the prior days. We were informed that the biogas clean up skid was in the process of being commissioned. The biogas clean up skid operates at 150 psig. During both events on February 13 and 14, a test of the biogas clean up was occurring when it shut down. A valve leading to the first compressor failed open causing the pressure to back flow to into the biogas header. Since the pressure was above 9 inches of water column, the material was flared. It was indicated that when bleeding off the pressure from this system, they plan on using 5 to 10% of the valve to slowly bleed back to the flare. In this instance, the biogas valve was wide open to the header.

The team met with Justin Peterson and Tim Golden from Babcock & Wilcox MEGTEC who were on site to commission the biogas clean-up skid. They explained the system uses water to remove carbon dioxide from the biogas. The system has a water tank and air coolers for the water. Water is circulated into Tower 1 that will remove some hydrogen sulfide and carbon dioxide. The end result is 98% methane. Tower 2 is used to get the methane within the natural gas transmission specifications. Tower 3 is used to remove the carbon dioxide from the water through heated fresh air injection into the water. The carbon dioxide and air are sent directly to the atmosphere. The water is recycled. The only additive which is placed in the water is caustic for pH control. No other additives were planned for the water. Tower 1, and 2 were filled with different types of packing to get the desired gas cleanup. A final booster compressor is used to pressure the methane up to 500 psig to enter into the natural gas pipeline. There are transfer meters and analyzers used to ensure amount and quality.

I informed Kevin and took photographs of Tower 1, 2, and 3, including their data plates and an overview (Photo No. 11 to 14).

While inspecting this area, Laura observed a propane tank and torch leaning against the fence. Laura inquired concerning this device to Perry Winkler. He indicated this was used to unfreeze lines. While not clear if this was used on water or gas lines, Laura clearly indicated to him that this is unacceptable practice on a flammable system and should be removed from the facility. Perry indicated that it would be.

Photo No. 11: Biogas Clean Up Skid, facing east, IMG_0200, taken by Dave Hensley, Cropped, Brightness Adjusted, and Centered to Show Propane Tank (Attachment 3)

Carbon dioxide cylinders were present at the Biogas Clean-Up skid to be used for startup activities.

We then went to plant manager (Perry)'s office where we broke into the two groups. Sean and the NDEQ inspectors began the FLIR survey accompanied by Kevin and other Big Ox staff. Sean took FLIR footage of the PRVs, gas duct, and flare, some from the roof and some from the ground (the footage of the PRVs and duct are usually no closer than 30 feet though, and sometimes as far away as 60 feet). Laura and I remained with Perry Winkler, and met Rob Ernest (Operations Manager) in the plant manager's office to conduct the Clean Air Act 112(r)(1) inspection. We utilized a Region 7 U.S. Environmental Protection Agency Checklist for General Duty Inspection Under CAA 112(r). Sean and NDEQ left the facility at approximately 11:55 AM, and Kevin Bradly rejoined Laura and I.

The NDEQ inspectors made some observations of potential concerns during the inspection. These included:

- Written records of operating hours for the flare, permit condition III.(A)(3)(c) & III.(A)(5)(a),
- Operating hours of the flare were apparently being logged, but were not available in a, readable format, permit condition II.(B)(2),
- Written records of malfunction events that EPA and NDEQ inspectors witnessed on February 13th and witnessed by EPA inspector Sean Bergin on February 14th, 2017, permit condition II.(B)(6), a notification that needed to be submitted for these events, permit condition II.(E) and Title 129 - Chapter 35 - 005.
- EU07 scrubbing process is not present - "*will result in crystalline sulfur solids that will be washed and sold as a sulfur by-product*?"

These observations are documented by NDEQ at https://ecmp.nebraska.gov/publicaccess/viewer.aspx?MyQueryID=180&OBKey%5F%5F115%5F1=&OBKey%5F%5F114%5F1=105921.

Identify Hazards of Releases

On December 22, 2016, EPA sent a CAA Section 114 information request. Question 14 of this asked: "*14. Provide any documents associated with the identification of hazards from the process related to the incidents and hazard assessments of accidental releases with steps taken to minimize consequences of accidental release*." On February 8, 2017, Big Ox via Kelley Drye & Warren LLP responded in a letter to EPA: "*We are working with Big Ox's safety manager to identify the design and operating standards and any hazard identification or assessments that Big Ox has employed or completed to ensure a safe facility. We will be sure to provide these to EPA when they become known and available.*"

I included process hazard analyses or hazard reviews, any release scenario documentation, and siting documents on a list of document to be reviewed (Attachment 1), on February 13, and did not receive any.

On February 15, I verbally requested any documentation concerning identification of hazards which may result from a release of extremely hazardous substances at Big Ox. I asked if a process hazard analysis or hazard review had been done. Big Ox was not able to provide any of these documents during the inspection. Kevin and Perry said none had been done. Laura asked if their insurance company had done a risk assessment including the release of a hazardous substance. Kevin indicated that they might have and he'd look into it. Perry did not think that they had. I asked if they had done a hazard review of any kind. Kevin stated that he did not think they needed to since they do not have above a threshold quantity of a listed hazardous substance, and are not regulated under CAPP. I agreed that they are not regulated under CAPP. I explained that the CAA Section 112(r)(1), known as the General Duty Clause does apply to Big Ox, because they are a stationary source that handles, stores, or produces an extremely hazardous substance. Big Ox produces methane and hydrogen sulfide, hazardous substance listed at 40 C.F.R. Part 68.130, as components of biogas.

We asked if their biogas was a NFPA class 4 flammable. Big Ox produced a biogas Safety Data Sheet (SDS) to be reviewed. I was able to locate this SDS online at http://www.linde-gas.com/internet.global.lindegas.global/en/images/Compressed%20Methane17_24362.pdf?v=1.0, provide as Attachment 4. Laura reviewed this SDS and wrote the following:

> The biogas SDS was provided. SDS# 8321 was for Methane, Compressed and was generated by Linde. SDS was created on 01/27/2005 and revised 01/04/2011. SDS was 2 pages long. The SDS did not contain the NFPA rating, nor a flashpoint of the material. Based upon the UN code 1971, this gas should be a NFPA rating of 4. Based upon this observation, we concluded that 100% of the biogas is included in the calculation for maximum inventory. The maximum inventory provided in the 114 request does not incorporate the Biogas Clean-Up Skid.

A journal article, titled *Lessons for Safe Design and Operation of Anaerobic Digesters*, in Symposium Series NO. 158, Hazards XXIII, 2012 Institution of Chemical Engineers, http://press.hse.gov.uk/2015/farm-workers-death-leads-to-prosecution-over-exposure-to-toxic-gases/, highlighted 13 deaths at biogas facilities worldwide from 2003 to 2010 from gas exposure and explosions.

The biogas industry has recognized some unique hazards. The industry group American Biogas Council has a presentation on safety of biogas on their website http://americanbiogascouncil.org/webinars/safety.pdf, in which unique hazards of biogas are listed including; higher risk of oxygen entrainment, higher risk of spark sources, 100% saturated gas which lends to other design considerations such as higher level of corrosion, condensation, freezing, fouling. etc. Big Ox is a member of the American Biogas Council per the website http://americanbiogascouncil.org/membership_list.asp.

The U.S. Senate wrote in S. REP. No. 101-228, at 211 (1989) ("Senate Report") reprinted in 1990 U.S.C.C.A.N. 3385, 3596, 1989 WL 236970 ** 182: "*the release of any substance which causes death or serious injury because of its acute toxic effect or as a result of an explosion or fire or which causes substantial property damage by blast, fire, corrosion or other reaction would create a presumption that such substance is extremely hazardous.*"

Based on the flammability of biogas and past biogas accidents it is also an extremely hazardous substance.

The propane flame heat source in area of the biogas clean up skid handling methane might have been identified as a hazard and not used. Big Ox has identified some areas that have electrical classification such to prevent entry of non-intrinsically safe equipment.

Big Ox has experienced worker injury events. These may have been prevented or lessened in severity if the hazards which may result from a release of extremely hazardous substances had been identified. Through information from Bix Ox, Nebraska State reports, news media, reports to EPA, and OSHA, we identified the following incidents:

- October 19, 2016, an incident in which a contractor employee sustained injury working on Gas Energy Mixing (GEM) system was injured,
- December 14, 2016, an employee injury due to gas exposure while installing a pipe received cardiopulmonary resuscitation (CPR) and transported to the hospital,
- January 8, 2017, two employees were exposed to unidentified chemicals, and
- January 12, 2017, trucking contractor employee fell from his truck.

I discussed these incidents briefly with Kevin. He stated that the incidents had been OSHA incidents and that they were investigating. OSHA has a mandate to protect workers. EPA has a mandate to protect human health and the environment so there is some overlap. I explained that our concern comes mainly from the potential for off-site impacts, but also were concerned about what occurred onsite.

On October 19, 2016, an incident occurred in which a contractor employee was injured. Kevin stated that the injury was due to the contractor being in the wrong location and that the contractor had not reported the injury before leaving the work site. Big Ox found out about the injury via the news media and had to contact the out of state contractor office to obtain details.

EPA sent a chemical release questionnaire to Big Ox on December 22, 2016, in response to a December 14, 2016, hydrogen sulfide release that was reported to EPA and in the news media. On March 1, 2017, Big Ox responded through Kelly Drye & Warren LLP. The release occurred when a Big Ox employee made a new hole into the head space of an anaerobic digester. This was done without management approval and identification of potential hazards that would occur. The employee was injured, received CPR, and was hospitalized. The amount of hydrogen sulfide released was below the 100-pound hydrogen sulfide CERCLA reportable quantity. The quantity of biogas, and thus methane and carbon dioxide, were higher than the quantity of hydrogen sulfide. Nether methane nor carbon dioxide have CERCLA or EPCRA release reportable quantities, but they do have their own release and exposure risks. The release occurred inside a building at Big Ox but was released to the air when the doors to the building were opened during the emergency response. There are no release thresholds quantities associated with CAA Section 112(r)(1).

According to Kevin, two workers were splashed with chemical and one employee was not wearing the required chemical splash suit, on January 8, 2017. Similar to a conventional rain suit, it would have provided protection from chemical contact with the skin.

Perry, Mike, Kevin, Robert, Laura, and I discussed methodologies of how hazard identification under the General Duty Clause are typically done. I noted that it is broad with the methods left up to the facility as long as they use "*appropriate hazard assessment techniques*" as stated in CAA 112(r)(1). Big Ox mentioned layer of protection analyses, hazard and operability studies, and what-if, methodologies. I said these would be appropriate, or similar techniques could be used. We provide Big Ox a copy of "Guidance for Implementation of the General Duty Clause Clean Air Act Section 112(R)(1)", EPA 550-B00-002, May 2000. Available on the https://www.epa.gov/rmp/general-duty-clause-under-clean-air-act-section-112r1 website.

Based on this information, I found the following deficiency:

1. **Big Ox Energy- Siouxland, LLC failed to identify hazards which may result from accidental releases using appropriate hazard assessment techniques CAA 112(r)(1).**

Design and Maintain a Safe Facility

Process Safety Information (PSI)

Big Ox has three ring binders on a shelf in the plant manager's office that contains detailed process information. I asked if it was okay and took photographs of this, Photo No. 15, 16, and 17. This documentation included process safety information such as materials of constructions, piping and instrumentation diagrams, specification sheets, design limits, operating and maintenance manuals, preventative maintenance schedules, pressure test data, and electrical classifications.

Standard Operating Procedures (SOPs)

Standard operating procedures are utilized by Big Ox. Procedures are maintained onsite and on an intranet site for access by all Big Ox employees. They contain information about the steps for each operating phase, operating limits, safety and health considerations, and safety systems and their functions. I reviewed an operating procedure titled *SYS10-009 – Resetting the Flare*. It contained easily understandable steps for operating the process, and contained photos for easy identification of process equipment. Perry stated that the procedure had been developed with a flare expert during a site visit, and this was a practice that they routinely used to develop procedures. This operating procedure included a section on personal protection equipment.

Training

Big Ox has an operator training program that appears to cover the potential hazards of the process, proper process operations, and proper maintenance procedures. This program is computer and classroom based. Perry showed us the hydrogen sulfide and methane training presentation that encompassed 44 slides and appeared to be thorough. Kevin said some training records are maintained on site and some are maintained at the corporate office. I requested to view an example of training records related to safety considerations of biogas. Training records for the employees are kept in Denmark, WI. Kevin emailed personnel in the Denmark office and they emailed him a Portable Document Format copy of a training class sign in sheet. He showed this to me on his cell phone. The sign in sheet was for methane gas safety training dated July 8, 2016, and signatories included Perry and Rob.

Preventive Maintenance Programs

Big Ox uses Computerized Maintenance Management System (CMMS). Mike and Bobby Hirsch (Maintenance Technician) showed Laura and I the CMMS system on an IPad. They showed how the system generated emails for ensuring maintenance activities are completed. This system will contain a parts inventory and tracking of parts as well as preventative maintenance for the systems. They are also able to generate work orders on demand to document maintenance not performed per a schedule. They are presently in the process of fully implementing this system. The maintenance details for the biogas clean up skid had not been uploaded into the system at the time of the inspection. We asked if it contained the maintenance for the entire facility. Mike and Bobby said there was not much maintenance for the anaerobic digesters, but what was required was in there. The biogas clean up skid was undergoing commissioning at the time of the inspection, and the process of uploading the maintenance requirements was underway. Mike stated maintenance details for the rest of the facility had been uploaded. The anaerobic digesters do not have much maintenance requirements as they are essentially large concrete tanks.

We were not provided a preventive maintenance procedure, or maintenance documentation. It is unclear how much of the maintenance system was designed prior to the relevant equipment beginning to handle extremely dangerous substances.

Based on this information, I find the following deficiency:

2. **Big Ox Energy- Siouxland, LLC failed to design and maintain a safe facility taking such steps as are necessary to prevent releases CAA 112(r)(1).**

Compliance Audit

According to a discussion with Perry, Big Ox does do safety audits in which compliance with company policy on personal protective equipment and work practices are checked.

Incident Investigation

Keven stated that Big Ox did not have a formal incident investigation procedure, however they do investigate incidents. EPA sent a CAA Section 114 information request to Big Ox on December 22, 2016, in which EPA asked for detailed descriptions of the October 19, 2016, and December 14, 2016, hydrogen sulfide releases. EPA has not received this information. Big Ox has asserted that is not subject to CAA Section 112(r) and thus not required to answer the question. I asked if Big Ox had incident reports for the incidents on October 19, 2016, December 14, 2016, January 8, 2017, and January 12, 2017. Keven stated that they did have investigations. I had requested to review incident reports for these incidents in the list of document to be reviewed (Attachment 1), and restated that request. Keven said they are OSHA incidents, and Big Ox will stay with their statement in the response to the CAA Section 114 information request and will be responding to the Chemical Release Questionnaire that is not due yet.

Big Ox is regulated by OSHA. OSHA has four investigations/inspections ongoing related activities at Big Ox.

#	Activity	Opened	RID	St	Type	Sc	NAICS	Establishment Name
1	1202492	1/12/2017	728900	NE	Referral	Partial	484220	Anthony P & L, Inc.
2	1204402.015	01/09/2017	0728900	NE	Referral	Partial	211111	Big Ox Energy Siouxland, Llc
3	1198149.015	12/16/2016	0728900	NE	Referral	Partial	211111	Big Ox Energy Siouxland, Llc
4	1184927.015	10/19/2016	0728900	NE	Complaint	Partial	211111	Big Ox Energy Siouxland, Llc

Table 1: OSHA activity at Big Ox
https://www.osha.gov/pls/imis/establishment.search?p_logger=1&establishment=big+ox&State=all&officetype=all&Office=all&p_case=all&p_violations_exist=all&startmonth=03&startday=01&startyear=2012&endmonth=03&endday=01&endyear=2017

I asked about the odor complaints received by the NDEQ. Kevin and Rob stated that odor complaints are only occurring from specific public individuals. Big Ox indicates they follow-up on complaints. Rob indicated that he went to the person's address when an odor complaint was issued. No wind was blowing, and no odor was found. All odor complaints are routed to Kevin.

A new scrubber was placed on the building ventilation system, and all vents from the building are routed through this scrubber. It contains ferrous chloride to help control hydrogen sulfide odors. Activated carbon is also used in the scrubber.

We discussed missing data from the CAA Section 114 information request response. Kevin indicated that all data was given to the lawyers. Laura pulled up the response EPA had received

and showed Kevin. Specifically, the data missing for the digester sampling from January 1 to January 16. This began a short discussion concerning the Big Ox lawyers not providing the data requested and provided by Big Ox.

Managing Changes

Big Ox is developing a program for managing changes at their facility. It covered the technical basis for the proposed change, the impact of change on safety and health, modifications to operating procedures, necessary time period for the change and, authorization requirements for the proposed change. At the time of the inspection, they were working out the details of the lines of authorization.

Minimize Consequences of Releases

Big Ox developed an emergency response plan that lists emergency contacts and steps to respond to emergencies. Big Ox personnel do not respond to emergencies. They had a plan to evacuate the facility to a muster point at the guard building. Big Ox coordinates with local emergency planners and responders. Big Ox stated that they have coordinated with Clint Rasmussen, Dakota City Fire Chief, and Deanna Beckman, Dakota County Emergency Manager. On March 1, 2017, I sent an email to Deanna Beckman to verify this.

Big Ox utilizes personal protective equipment, such as hard hats, safety glasses, face shields, and chemical spill suits, to minimize the consequences of releases to employees. They also have safety showers located in the facility as well as a portable safety shower that can be moved to different areas for specific projects. I observed that fire extinguishers were placed throughout the facility. Two identical air monitoring stations are used to monitor the air quality inside the building, one on the north end and one on the south end of the digester building. I asked permission, and took photographs of the air monitor on the north end of the building (Photo No. 18 to 24). This system monitors oxygen, carbon monoxide, hydrogen sulfide, and lower explosive limit. According to a discussion with Perry, an audible and visual alarm would notify workers in the area, and an alarm would appear on control displays.

Photo No. 19: Air Monitors in North End of Process Building, facing east, IMG_0208, taken by Dave Hensley, cropped, (Attachment 3)

Big Ox uses radio communication to coordinate actions amongst employees. Big Ox employees are issued personal hydrogen sulfide meters to be worn at all times they are in process areas. Maintenance personnel also have access to 4 gas meters for specific jobs. These provide read outs and alarms for oxygen, lower explosive limit, hydrogen sulfide, and carbon dioxide). I observed the Big Ox employees use radios, and wearing hydrogen sulfide monitors, safety glasses, hard hats, and high visibility clothing when in process areas.

Closing Conference

We held a closing conference with Big Ox at about 3:20 PM on February 15, 2017. In attendance for Big Ox was Perry Winkler, Plant Manager; Mike Nelson, Maintenance Manager; Kevin Bradley, Director of Business and Economic Development; and Robert Ernest, Operations Manager. From EPA, Laura Brewer and I (Dave Hensley) were present, as Sean and the NDEQ inspectors had departed earlier when they had finished the FLIR survey. Sean had provided Big Ox with a burned compact disc of the FLIR videos he had recorded. I explained that Laura and I had done a CAA Section 112(r)(1) General Duty Clause inspection. I asked Kevin to review the photographs on the cameras screen, and asked if there was any CBI captured. Kevin said that there was no CBI in the photographs. I noted the preliminary finding of a failure to identify hazards which may result from extremely hazardous substances releases using appropriate hazard assessment techniques CAA 112(r)(1). I filled out a Notice of Preliminary Findings form. Kevin and I signed this form (Attachment 5). I did not fill out a confidentiality form or receipt for documents/samples form due to not receiving any documents from the facility.

Post Inspection Compliance

Post inspection Big Ox has hired Michael Major, of Powerful Compliance, LLC, that has contact EPA to request compliance assistance. I am in communication with him, and have provided an example of a document commonly used to comply with CAA 112(r)(1) identification of hazards which may result from accidental releases using appropriate hazard assessment techniques. We have also discussed hazard assessment techniques. He has also indicated that the biogas clean up skid has not begun operation.

_____

Dave Hensley
Compliance Inspector

Attachments

1 - List of Document to Be Reviewed
2 - Notice of Inspection Form
3 - Photograph Log
4 - SDS# 8321 Methane, Compressed by Linde
5 - Notice of Preliminary Findings Form
6 - CD – Attached to Report